

INFRASTRUCTURE PHASING AND COSTS

The phasing plan presented in Section 7 was packaged to take into consideration major infrastructure improvements needed to facilitate the development of each phase. It is anticipated that land sales will be by phase or sub-phase and that different developers could own adjoining phases or sub-phases. Within each phase, specific water, transportation and drainage infrastructure is needed to complete development of the phase. To the extent possible, the phase and sub-phases were developed to reduce overlapping responsibility for infrastructure development between phases and sub-phases should, for example; two developers having parallel responsibility for construction of a segment of road or drainage facility.

This section further describes the infrastructure needed for each phase and sub-phase and present cost opinions for each sub-phase.

WATER, RECLAIM AND SEWER IMPROVEMENTS

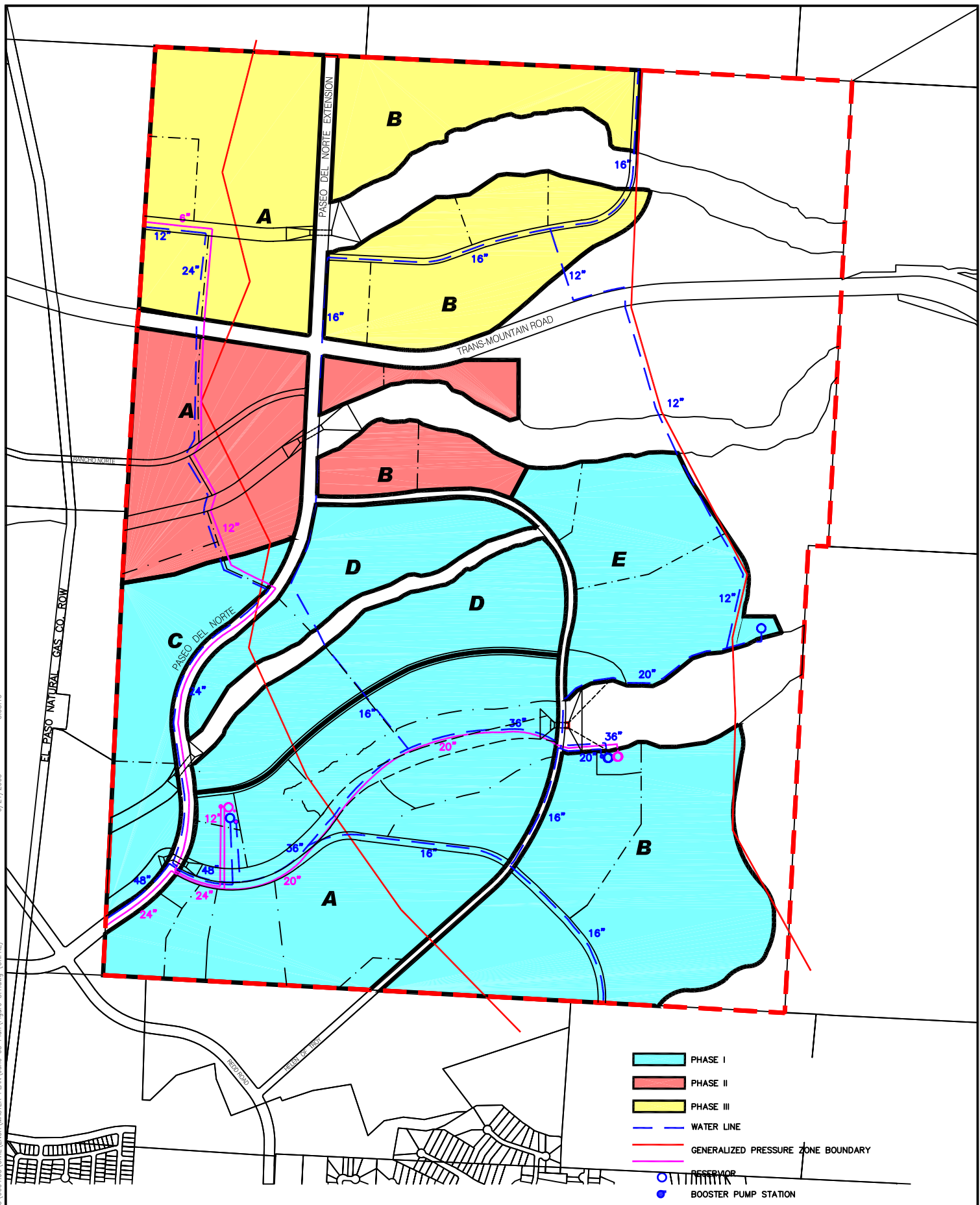
Water

In order to develop the master plan area EPWU water storage, pumping, and transmission facilities have to be brought into the area. The base facilities needed to serve the master plan area have been planned by the EPWU. They include the Artcraft No. 2, Artcraft No. 3 and Artcraft No. 4 storage reservoirs and pumping stations, and transmission mains connecting these facilities. These reservoirs serve the CCC2 and CCC3 pressure zones and are required for any development to occur within the study area. These improvements can be seen in Figure 8.1

Artcraft No. 2 storage facilities provide no service to the project area, but are located within the project area and need to be in place to facilitate transmission of water to the next pressure zone. Construction of Artcraft No. 3 facilities will allow development to begin in the lower part of Phase I, Sub-Phase A and Phase I, Sub-Phase C of the master plan area. Artcraft No. 3 facilities have to be online before Artcraft No. 4 can be put into service. Water supply for development in the remaining parts of Phase I and all of Phase II and Phase III are dependent on Artcraft 4 facilities also being on line. Lateral development of Phases II and III will require extensions of the transmission lines to these areas.

Reclaim

The reclaim system will be limited to the CCC2 pressure zone. The reclaimed improvements will be phased in with the water improvements. The Artcraft #2 and #3 reservoirs will need to be constructed to serve Phase I. The extension of transmission and distribution lines are the only improvements needed to develop Phase II and Phase III. The required reclaim improvements are presented in Figure 8.1.



Sewer

The sewer infrastructure will be constructed as development progresses. The only requirement for the sewer improvements is that the downstream interceptors are constructed first. It is assumed that off-site sewer infrastructure will be constructed by developers downstream of the site. Because of the relatively steep grades in the project area, the interceptor sewers will be small diameter pipe and will be the responsibility of the developer to install. Figure 8.2 shows the required sewer improvements for each phase.

TRANSPORTATION IMPROVEMENTS

The master plan area includes two major roadways, Paseo del Norte and the extension of Helen of Troy. Phases and sub-phases have been packaged such that roadway segments needed to serve the phase or sub-phase are fully contained within the phase or sub-phase package; i.e. two potential developers will not be developing parallel sides of a roadway segment. Phase I will require Helen of Troy and the southern portion of Paseo del Norte to be constructed. An additional roadway, Arterial 1 will also need to be constructed. The construction of Paseo del Norte is vital to the development of this area. Paseo del Norte will carry large volumes of traffic and will link the commercial areas within the study area. The transportation improvements can be seen in Figure 8.3. Phase II will require extending Paseo del Norte to Transmountain Road, the extension of Rancho Norte and completing the Helen of Troy extension. Phase III will require the completion of Paseo del Norte within the study area as well as Arterial 3. The transportation system improvements will also include the hike/ bike system discussed in Section 3 of this report.

DRAINAGE IMPROVEMENTS

The drainage features shaped the development of this area. The phasing plan was developed to address the specific drainage improvements. Each sub-phase was delineated in order to contain a drainage path and its associated improvements. By delineating the sub-phases in this manner it requires the drainage improvements for a flow path to be constructed in one phase by a single developer.

- Phase I will require the culvert crossings under Paseo del Norte and Helen of Troy for flow paths 38A and 38B as well as the concrete channels west of Paseo del Norte that will tie into the Ranchos Las Lomas drainage system. Phase I will also require the construction of the hybrid channel that will contain portions of the hike/ bike system.
- Phase II will require the culvert crossing under Paseo del Norte to convey flows from flow path 39 and a concrete channel west of Paseo del Norte.
- Phase III requires the culvert crossing under Paseo del Norte and Arterial 3 and the concrete channel west of Paseo del Norte to convey flows from flow path 40. The drainage improvements will also require the construction of several park/ ponds to capture developed flows. The park/ ponds and remainder of the drainage improvements can be seen in Figure 8.4.

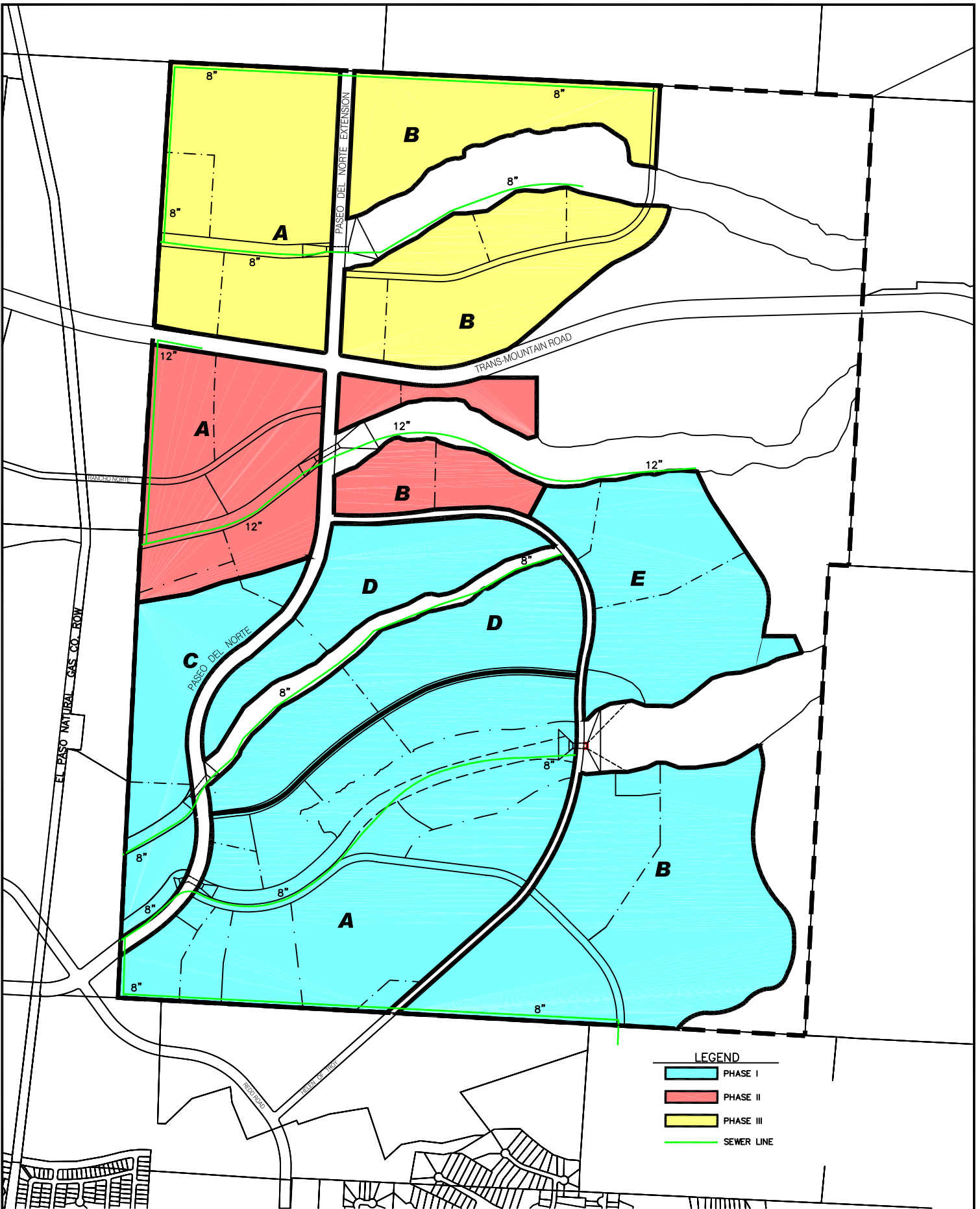


FIGURE 8.2
SEWER FACILITIES
BY PHASE



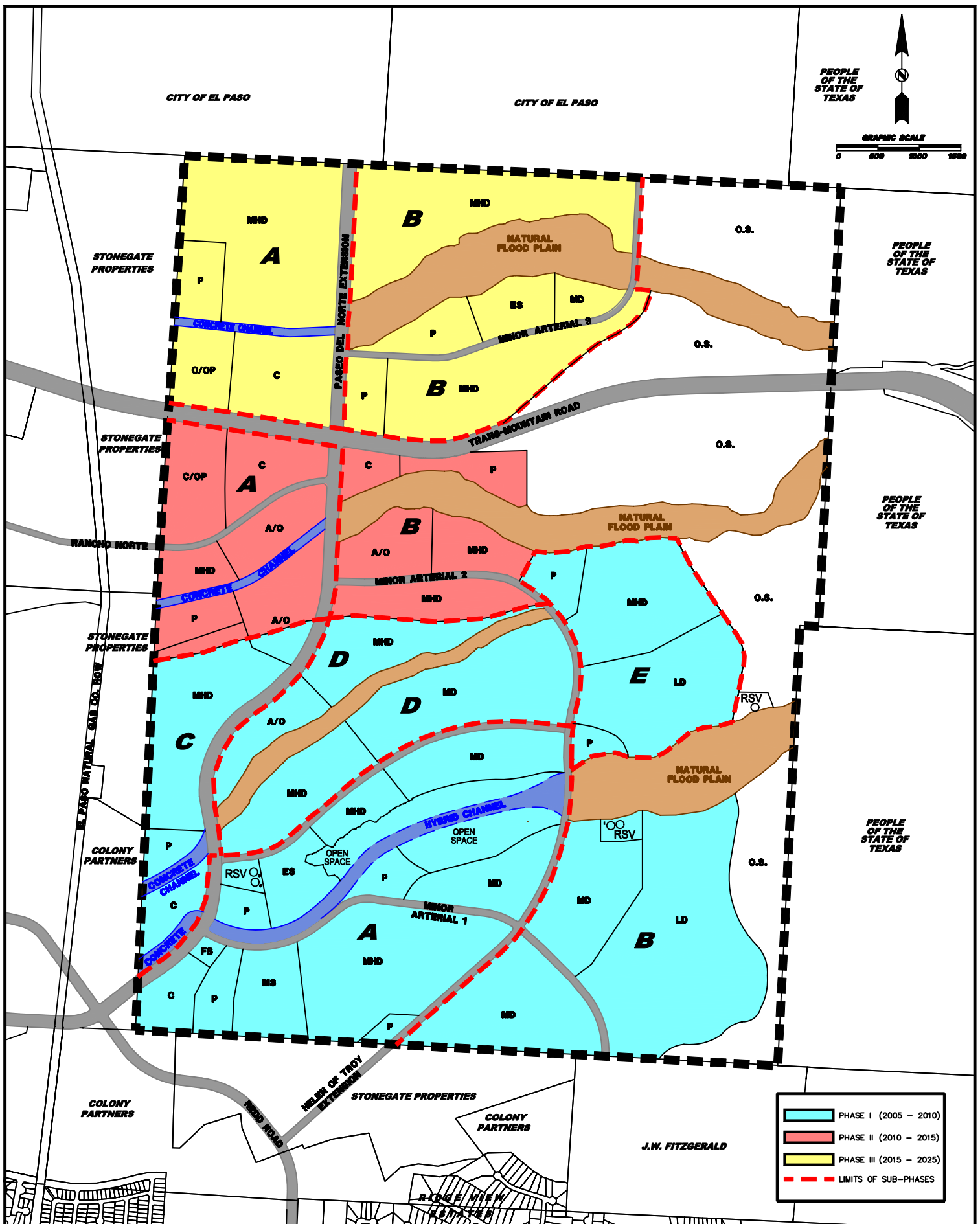
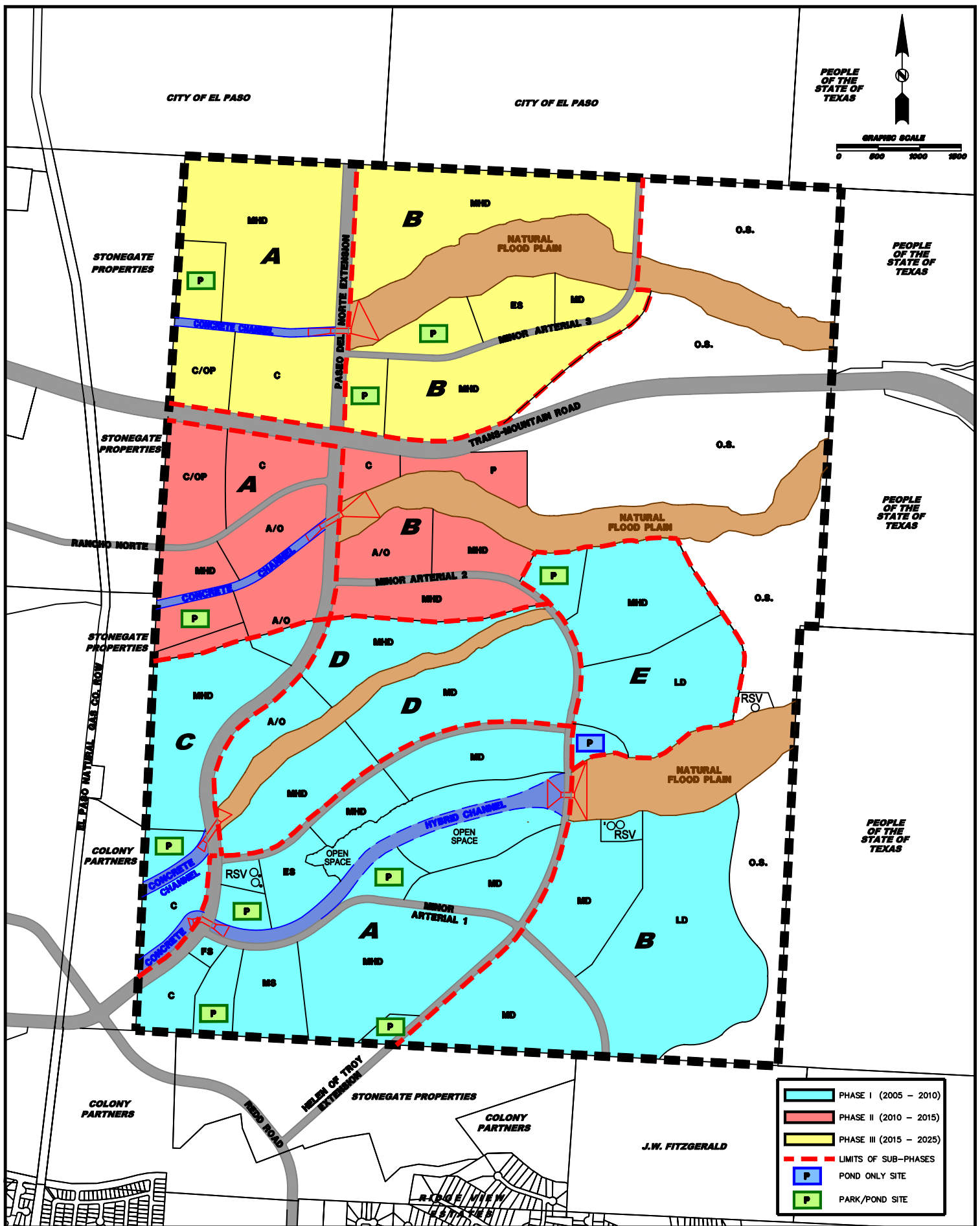


FIGURE 8.3
PROPOSED TRANSPORTATION
IMPROVEMENTS BY PHASE



INFRASTRUCTURE PHASING AND OPINIONS OF COST

Based on the phases described above, infrastructure will be developed to serve each area. The following sections will outline the water, sewer, reclaim, transportation and drainage improvements needed by each sub-phase and identify the associated cost. The costs are also separated into developer costs, EPWU costs and TxDOT costs for major infrastructure only. Internal development costs incurred by the developer are not included in this report. These costs are fully the responsibility of the developer and include costs for site grading, local streets, water lines less than 12-inches in diameter, service lines, taps, and all other development costs necessary to fully develop each phase. The costs shown in this report only reflect major infrastructure that is required to allow development of smaller parcels occur. Typically, these internal development costs may range from \$40,000 to \$60,000 per acre based on historic development of similar areas in El Paso. The EPWU costs include reservoirs, booster stations, transmission lines and developer reimbursements based on the EPWU Rules and Regulations. The costs incurred by TxDOT only include the development of Paseo del Norte. The developer costs include the remainder of the infrastructure that is not covered by the EPWU or TxDOT.

The costs contained in this report are on an order of magnitude developed using standard estimating practices. These cost opinions were developed for comparison purposes and do not reflect a detailed cost opinion. The scope of this project was not intended to produce detailed cost opinions.

Phase I

Phase I is broken in five sub-phases, A through E. Phase I will contain the initial development in the area and will develop approximately one half of the of the total study area, which is mostly residential. Phase I-A will consist of the following:

Water

- Artcraft #2 Reservoir
- Artcraft #2 Booster Station
- Artcraft #3 Reservoir
- 48, 36, 24 and 16-inch transmission lines

Sewer

- 8-inch collectors

Reclaim

- Artcraft #2 Reservoir
- Artcraft #2 Booster Station
- Artcraft #3 Reservoir
- 24, 20 and 12-inch transmission lines

Transportation

- Minor Arterial 1
- Helen of Troy extension
- Paseo del Norte

Drainage

- Hybrid Channel east of Paseo del Norte
- Culvert Structures under Paseo del Norte and Minor Arterial 1
- Concrete Channel west of Paseo del Norte
- Park Ponds

Table 8-1 Phase I-A Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$440,761	\$7,356,291	-
Sewer	\$503,360	-	-
Reclaim	-	\$3,741,496	-
Transportation	\$7,269,600	-	\$1,380,400
Drainage	\$3,832,745	-	\$638,940
Sub-Total	\$12,046,466	\$11,097,787	\$2,019,340
Phase I-A Total \$25,163,593			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase I-B will consist of the following:

Water

- Artcraft #3 Booster Station
- Artcraft #4 Reservoir
- 20 and 16-inch transmission lines

Sewer

- 8-inch collectors

Reclaim

- No Infrastructure Required

Transportation

- Minor Arterial 1

Drainage

- No Infrastructure Required

Table 8-2 Phase I-B Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$137,899	\$3,707,257	-
Sewer	\$145,028	-	-
Reclaim	-	-	-
Transportation	\$1,010,000	-	-
Drainage	-	-	-
Sub-Total	\$1,292,927	\$3,707,257	
Phase I-B Total \$5,000,184			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase I-C will consist of the following:

Water

- 24 -inch transmission lines

Sewer

- 8-inch collectors

Reclaim

- 12-inch transmission lines

Transportation

- Paseo del Norte

Drainage

- Culvert Structures under Paseo del Norte and Minor Arterial 1
- Concrete Channel west of Paseo del Norte
- Park Ponds

Table 8-3 Phase I-C Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$256,635	\$88,816	-
Sewer	\$82,368	-	-
Reclaim	-	\$197,157	-
Transportation	-	-	\$2,300,000
Drainage	\$562,845	-	\$583,600
Sub-Total	\$901,848	\$285,973	\$2,883,600
Phase I-C Total \$4,071,421			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase I-D will consist of the following:

Water

- 16-inch transmission lines

Sewer

- 8-inch collectors

Reclaim

- No Infrastructure Required

Transportation

- Minor Arterial 1

Drainage

- No Infrastructure Required

Table 8-4 Phase I-D Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$143,485	\$14,714	-
Sewer	\$238,264	-	-
Reclaim	-	-	-
Transportation	\$960,000	-	-
Drainage	-	-	-
Sub-Total	\$1,341,749	\$14,714	-
Phase I-D Total \$1,356,463			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase I-E will consist of the following:

Water

- 12-inch transmission lines

Sewer

- 12-inch collectors

Reclaim

- No Infrastructure Required

Transportation

- No Infrastructure Required

Drainage

- Park Ponds

Table 8-5 Phase I-E Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$148,707	-	-
Sewer	\$427,328	-	-
Reclaim	-	-	-
Transportation	-	-	-
Drainage	\$364,210	-	-
Sub-Total	\$940,245	-	-
Phase I-E Total \$940,245			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Table 8-6 Phase I Opinion of Total Cost*

	Developer	EPWU	TxDOT
Phase I-A	\$12,046,466	\$11,097,787	\$2,019,340
Phase I-B	\$1,292,927	\$3,707,257	-
Phase I-C	\$901,848	\$285,973	\$2,883,600
Phase I-D	\$1,341,749	\$14,714	-
Phase I-E	\$940,245	-	-
Sub-Total	\$16,523,235	\$15,105,731	\$4,902,940
Phase I Total \$36,531,906			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase II

Phase II is broken into two sub-phases. This phase will be located near the intersection of Paseo del Norte and Trans-mountain, and will consist primarily of commercial, office park and apartment land uses. Phase II-A will consist of the following:

Water

- 24-inch transmission lines

Sewer

- 12-inch collectors

Reclaim

- 12-inch transmission lines

Transportation

- Rancho Norte extension
- Paseo del Norte

Drainage

- Culvert Structures under Paseo del Norte and Minor Arterial 1
- Concrete Channel west of Paseo del Norte
- Park Ponds

Table 8-7 Phase II-A Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$231,959	\$80,276	-
Sewer	\$179,840	-	-
Reclaim	-	\$172,749	-
Transportation	\$1,280,000	-	\$1,618,400
Drainage	\$1,289,695	-	\$595,980
Sub-Total	\$2,981,494	\$253,025	\$2,214,380
Phase II-A Total \$5,448,899			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase II-B will consist of the following:

Water

- 16-inch transmission lines

Sewer

- No Infrastructure Required

Reclaim

- No Infrastructure Required

Transportation

- Minor Arterial 1

Drainage

- No Infrastructure Required

Table 8-8 Phase II-B Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$158,846	\$16,289	-
Sewer	-	-	-
Reclaim	-	-	-
Transportation	\$1,390,000	-	-
Drainage	-	-	-
Sub-Total	\$1,548,846	\$16,289	-
Phase II-B Total \$1,565,135			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Table 8-9 Phase II Opinion of Total Cost*

	Developer	EPWU	TxDOT
Phase II-A	\$2,981,494	\$253,025	\$2,214,380
Phase II-B	\$1,548,846	\$16,289	-
Sub-Total	\$4,530,340	\$269,314	\$2,214,380
Phase II Total \$7,014,034			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase III

Phase III is also broken into two sub-phases. This phase will develop the area north of Trans-mountain that is primarily residential with some commercial acreage near the intersection of Paseo del Norte and Trans-mountain. Phase III-A will consist of the following:

Water

- 24 and 12-inch transmission lines

Sewer

- 8-inch collectors

Reclaim

- 12 and 6-inch lines

Transportation

- Paseo del Norte

Drainage

- Culvert Structures under Paseo del Norte
- Concrete Channel west of Paseo del Norte
- Park Ponds

Table 8-10 Phase III-A Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$122,915	\$27,608	-
Sewer	\$311,324	-	-
Reclaim	-	\$92,059	-
Transportation		-	\$2,260,000
Drainage	\$1,127,775	-	\$613,980
Sub-Total	\$1,562,014	\$119,667	\$2,873,980
Phase III-A Total \$4,555,661			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Phase III-B will consist of the following:

Water

- 16 and 12-inch transmission lines

Sewer

- 8-inch collectors

Reclaim

- No Infrastructure Required

Transportation

- Minor Arterial 3

Drainage

- Culvert Structures under Minor Arterial 3
- Park Ponds

Table 8-11 Phase III-B Opinion of Cost*

	Developer	EPWU	TxDOT
Water	\$624,683	\$42,552	-
Sewer	\$332,696	-	-
Reclaim	-	-	-
Transportation	\$2,640,000	-	-
Drainage	\$2,664,115	-	-
Sub-Total	\$6,261,494	\$42,552	
Phase III-B Total \$6,304,046			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Table 8-12 Phase III Opinion of Total Cost*

	Developer	EPWU	TxDOT
Phase 3-A	\$1,562,014	\$119,667	\$2,873,980
Phase 3-B	\$6,261,494	\$42,552	-
Sub-Total	\$7,490,812	\$162,219	\$2,873,980
Phase III Total \$10,859,707			

*Cost Opinion is for major infrastructure only and does not include internal development costs

Table 8-13 Opinion of Total Cost by Phase*

	Developer	EPWU	TxDOT
Phase I	\$16,523,235	\$15,105,731	\$4,902,940
Phase II	\$4,530,340	\$269,314	\$2,214,380
Phase III	\$7,823,508	\$162,219	\$2,873,980
Sub-Total	\$28,877,083	\$15,537,264	\$9,991,300
Total \$54,405,647			

*Cost Opinion is for major infrastructure only and does not include internal development costs